

The 15th International Conference on
Ferroelectric Liquid Crystals:

**Challenges in polar
self-assembling systems**



BOOK of ABSTRACTS and PROGRAM

Prague, Czech Republic
June 28 – July 3, 2015

FLC-15

**Abstracts of the contributions presented at the 15th
International Conference on Ferroelectric Liquid Crystals:
Challenges in polar self-assembling systems**

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The 15th International Conference on Ferroelectric Liquid Crystals, Prague, Czech Republic, 2015

12:50–14:30 Lunch

SESSION 13 (14:30–16:00; *chair: Ewa Gorecka*)

14:30–15:00 **Natasa Vaupotic**

INVITED LECTURE *Cubic and tetragonal phases based on chiral rod-like molecules*

15:00–15:20 **Mojca Cepic**

3D smectic phase: Can the discrete phenomenological model of antiferroelectric liquid crystals account for it?

15:20–15:40 **Jun Yoshioka**

Director/Barycentric rotation in Cholesteric droplets under heat flow

15:40–16:00 **Grzegorz Pajak**

Modulated structures induced by chirality and flexopolarization: Landau-deGennes approach

16:00–16:30 Tea time

SESSION 14 (16:30–18:00; *chair: Przemyslaw Kula*)

16:30–17:00 **Giusy Scalia**

INVITED LECTURE *The effects of well-dispersed carbon nanotubes on the phase sequence of ferro- and antiferroelectric liquid crystals*

17:00–17:20 **Yoshiaki Uchida**

Luminol emission in cholesteric liquid crystalline microcapsule

17:20–17:40 **Soto Bustamante**

Electropolymerization process as a tool to enhance alignment layer for ferroelectrics

17:40–18:00 **Martin Cigl**

Azo-based liquid crystals with stabilized Z-isomers

Friday, July 3

SESSION 15 (9:00–10:40; *chair: Jan Lagerwall*)

9:00–9:50 **Vladimir Chigrinov**

KEY-NOTE LECTURE *Ferroelectric LC devices for displays and photonics*

9:50–10:20 **Morten Geday**

INVITED LECTURE *Ultrafast AFLC based for passive display for true 3D images*

10:20–10:40 **Stephen Morris**

Optically switchable smart windows and photovoltaics using chiral liquid crystals

10:40–11:10 Coffee break

INVITED LECTURE

Ultrafast AFLC based for passive display for true 3D images

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Liquid crystals (LC) have been widely used in display technology for many years and has over the last decade become the dominant display technology in a large range of applications starting at high, or ultra-high spatial resolution micro projector screens to large area direct view home cinema displays, via laptop computer displays and telephones.

In the course of the development of commercial liquid crystal displays (LCD), the nematic LC has been evermore dominant since the *industrially led* development of high quality thin film transistors, for making active matrix displays, complex electrodes, for in-plane switching, and multiple alignment directions for improving the viewing angle, has been faster, less disruptive and cheaper than the change to ferroelectric or antiferroelectric liquid crystal alternatives.

In order to meet the requirements needed for the manufacturing of a display capable of a full screen refreshment rate in the order 1 kHz we decided to employ smectic liquid crystals, which could be addressed passively. This high refresh rate was needed in order to generate a 3D image allowing for 19 different stereo viewing angles, which by the human brain would be perceived as a true 3D image.

During the cause of the development of the display both ferroelectric and antiferroelectric liquid crystals were tested. Eventually a temporal dithering antiferroelectric liquid crystal display was employed, using a novel high impedance addressing scheme and an hextuple scan (Fig. 1), leading to possible the fastest grey scale display developed at that moment.

This presentation will give a brief introduction to 3D imaging techniques, to surface stabilised structures and to conventional passive (A)FLCD driving followed by a detailed description of the development and results of the ultra-high speed display.

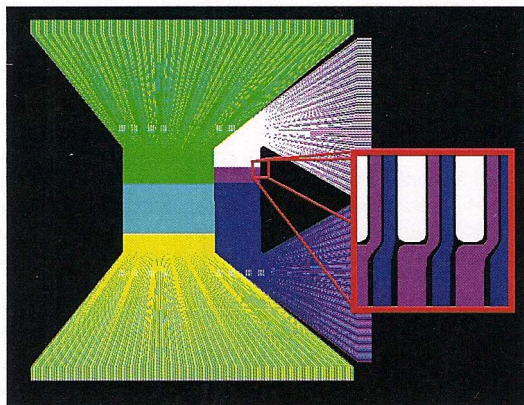


Fig. 1: The electrode design. The large inter-pixel space needed for image deviator allowed for hextuple scan.